July 13, 2012

Illinois Environmental Protection Agency
Permit Section
Bureau of Land -- #33
1021 North Grand Avenue East
Springfield, Illinois 62702

Subject: 2012 Groundwater Flow Evaluation
Mallard Lake Landfill, LPC #0438010004 DuPage County,
CS Geologic LLC Project No. 12010201

Dear Reviewer:

CS Geologic LLC (CSG) has completed a review of recent groundwater level data at the above referenced landfill facility. The attached drawing depicts the 1st Quarter 2012 groundwater flow conditions at the Mallard Lake Landfill. Upgradient well G201 exhibited the maximum potentiometric head, whereas the lowest potentiometric elevation has generally occurred at well G145 or G140 along the southeast corner of the landfill. As shown by the potentiometric surface map, groundwater flow is toward the southeast. Furthermore, as shown by the uppermost aquifer hydrographs presented in Figures 1 and 2, the groundwater elevations at each of the uppermost aquifer wells have generally fluctuated in unison suggesting a strong degree of hydraulic connection within the uppermost aquifer. As such, the groundwater flow direction has remained consistent despite considerable seasonal variation in groundwater elevations.

Similar southeasterly groundwater flow conditions were observed during the other monitoring events (Refer to groundwater elevations presented in Table 1). Due to the similarity in the groundwater flow conditions, only the 1st quarter 2012 data has been contoured. Hydraulic gradients from the 3rd and 4th quarters of 2011, and the 1st and 2nd quarters of 2012 are summarized in Table 2. Due to the strong infiltration from the West Branch of the DuPage River, upgradient wells G150, G151 and G201 have not been used for the gradient calculations. As shown by Table 1, the hydraulic gradient has instead been calculated utilizing groundwater elevation data from wells R116 (upgradient) and G145 (downgradient). As shown in Table 1, the hydraulic gradient at the landfill ranges between a low of 0.00050 ft/ft and a high of 0.00052 ft/ft.

Based on review of the 2011-2012 data, the groundwater flow conditions are consistent with historically observed conditions. Furthermore, the groundwater monitoring well locations appear to be appropriate based on the observed groundwater flow conditions.

Please do not hesitate to contact Craig Rawlinson at (847)-804-6064 if you have any questions or comments on the groundwater flow evaluation.

Sincerely,

Craig S. Rawlinson, P.G.
Principal Hydrogeologist

cc: Mr. Joe Benedict, Forest Preserve District of DuPage County
Mr. James Hitzeroth – Republic Services Inc.
Mr. Eric Ballenger - Republic Services Inc.

H:\work - new\Database\Mallard Quarterly\gw flow\Mallard 2012 GW Flow Evaluation.doc

Table 1
Summary of Groundwater Elevations
Mallard Lake Landfill
Hanover Park, Illinois

Well	8/9/2011 2011 qtr 3	10/31/2011 2011 qtr 4	2/13/2012 2012 qrtr 1	5/14/2012 2012 qrtr 2
G104	747.13	747.54	748.98	748.23
G118	748.13	748.41	749.65	749.01
G120	748.41	748.52	749.7	749.19
G121	764.60	757.05	758.33	767.14
G122	746.81	747.06	748.24	747.52
G123	746.64	746.89	748.09	747.38
G124	746.59	746.88	748.06	747.35
G130	765.52	764.74	765.7	765.99
G131	767.08	766.78	767.49	772.05
G133	746.43	746.69	747.85	747.13
G134	746.17	746.52	747.69	746.95
G138	746.22	746.61	747.64	747.02
G139	746.15	746.53	747.68	746.93
G140	746.13	746.48	747.64	746.93
G141	746.15	746.52	747.67	746.92
G142	746.20	746.57	747.71	746.99
G143	746.60	746.90	748.06	747.35
G144	746.60	746.89	748.07	747.35
G145	746.11	746.51	747.65	746.91
G146	746.47	746.66	747.85	758.22
G147	746.63	746.93	748.12	747.4
G148	746.43	746.77	747.99	747.2
G149	763.70	763.03	764.56	764.98
G150	748.87	749.17	750.42	749.83
G151	750.78	750.99	752.14	744.79
G28D	756.51	756.72	757.54	757.28
G28S	771.29	770.14	770.42	770.48
G52D	746.64	746.95	748.11	747.36
G52S	762.49	763.12	764.66	764.84
G54S	755.03	755.04	756.49	756.21
R105	746.13	746.52	747.68	746.92
R106	746.53	746.91	748.06	747.13
R107	763.92	764.53	765.22	765.08
R113	767.23	766.87	767.5	768
R115	747.00	747.29	748.51	747.85
R116	748.50	748.95	750.14	749.37
R125	748.69	749.22	750.53	750.19
R129	759.49	759.22	760.48	760.29
G201	754.87	754.57	755.57	755.11
G301		760.75	764.4	764.79
G132	763.68	762.94	764.6	764.97

Table 2
2012 Hydraulic Gradient Calculations
Mallard Lake
Hanover Park, IL

Date	Upgradient Well	Upgradient Well GW Elev (ft msl)	Down Gradient Well	Down Gradient Well Elev (ft msl)	ΔH, Change in Head (ft)	ΔL, Distance between wells (ft)	Hydraulic Gradient i=ΔH/ΔL (ft/ft)
3rd Qrtr 2011	R116	748.5	G145	746.11	2.39	4760	0.00050
4th Qrtr 2011	R116	748.95	G145	746.51	2.44	4760	0.00051
1st Qrtr 2012	R116	750.14	G145	747.65	2.49	4760	0.00052
2nd Qrtr 2012	R116	749.37	G145	746.91	2.46	4760	0.00052

Note

Gradient calculations based on upgradient well R116 to minimize induced infiltration effect in the vicinity of the W. Branch DuPage River.

Figure 1
Mallard Lake Landfill
Groundwater Elevation (msl)

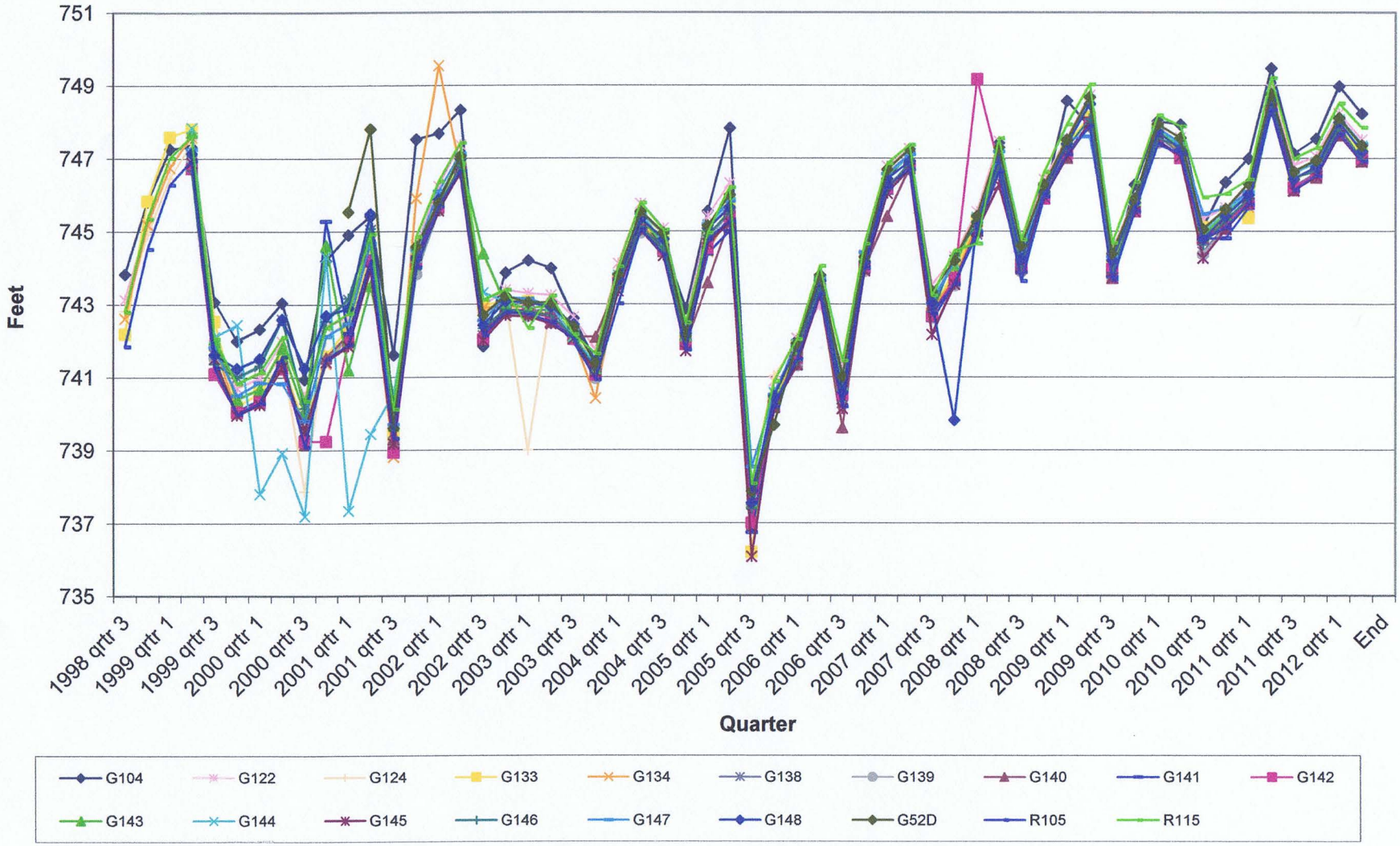

Figure 2
Mallard Lake Landfill
Groundwater Elevation (msl)